

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

Conditional Major (DRAFT PERMIT) No. F-05-030  
KENTUCKY DEPARTMENT OF MILITARY AFFAIRS, BOONE NATIONAL GUARD CENTER  
FRANKFORT, KY.

NOVEMBER 28, 2005

BRIAN BALLARD, REVIEWER

SOURCE I.D. #: 021-073-00054

SOURCE A.I. #: 1423

ACTIVITY #: APE20040002

**SOURCE DESCRIPTION:**

Emissions at the Boone National Guard Center originate from a paint spray booth, natural gas-fired boilers, Diesel powered emergency generators, parts washers using solvents, storage tanks containing Jet Fuel Grade JP-8, Diesel fuel, used oil, kerosene and gasoline, welding operations and maintenance shops.

The paint spray booth is located at the Combined Support Maintenance Shop (CSMS). The paint spray booth is used to paint various military trucks and vehicles. A paint spray air gun is used to manually apply solvent-based paint to metal parts. Water based paint and water based clean up solvent are also used in the spray booth as well as a High Volume Low Pressure (HVLP) spray gun. Natural gas-fired boilers are located at various buildings throughout the facility. No single boiler has a rated capacity (fuel input mmBTU/hr) of greater than 10 mmBTU/hr. There are four (4) Diesel powered emergency generators. The power output of these generators is 300 hp, 300 hp, 300 hp and 465 hp respectively. These emergency generators are listed as insignificant activities on the basis that they do not operate more than 500 hour per year each, verifiable by appropriate records. Parts washers using solvents are located at various building throughout the facility. The largest storage tank at the facility is a 20,000 gallon above ground storage tank containing Jet Fuel Grade JP-8. This tank was constructed in 1997. It is not subject to 40 CFR 60, Subpart Kb, or 401 KAR 59:050 on the basis of the volume and maximum true vapor pressure of the contents.

**COMMENTS:**

The paint spray booth is equipped with a Binks, accordion style paper filter for control of particulate matter (PM) emissions. A control efficiency of 90.0 % is used for the purpose of calculating PM and particulate matter less than 10 microns in diameter (PM<sub>10</sub>) emissions. An over spray of 55.0 % is used in calculating PM/PM<sub>10</sub> emission factors. The volatile organic compound (VOC) and PM/PM<sub>10</sub> emissions from painting are calculated using a material balance. The green paint was found to be the worst-case coating for solids content. A worst-case coating density of 10.39 lb/gal is used in calculating emission factors. The maximum applicator rate as specified in the application is 11.25 gallons per hour. If the green paint is sprayed at the maximum applicator rate for one hour, the mass limit specified in 401 KAR 59:010, Section 3(2) is exceeded. The mass limit will not be exceeded if the application rate of the paint is less than 8.43 gallons per hour. This operating limitation was arrived at assuming that the worst-case coating is being sprayed.

**COMMENTS (CONTINUED):**

Emission factors for natural gas combustion in boilers and space heaters are referenced from EPA's Factor Information Retrieval (FIRE) data system for source classification codes (SCCs) 1-03-006-03 and 1-05-002-06. Emission factors for Diesel fuel combustion in the emergency generators are referenced from AP-42, Table 3.3-1 for SCC 2-02-001-02. Emissions are calculated using a brake-specific fuel consumption of 7,000 BTU/hp-hr and a fuel heat capacity of 140,000 BTU/gallon.

Toxic emissions from the paint spray booth are modeled using SCREEN3. A review of the MSDS's in the application identified the following toxics: Cobalt, Ethyl Benzene, Hexamethylene Diisocyanate, Methyl Ethyl Ketone, Toluene and Xylene. Potential emissions of Hexamethylene Diisocyanate (CAS No. 822-06-0) were found to result in concentrations at 1,057 meters (0.66 mile) from the stack that exceed the prioritized chronic dose response value (PRDV) recommended by the EPA, Office of Air Quality Planning and Standards (OAQPS). The modeled concentration is 0.0644  $\mu\text{g}/\text{m}^3$ . The recommended value is 0.01  $\mu\text{g}/\text{m}^3$  (See <http://www.epa.gov/ttn/atw/toxsource/table1.pdf> for the PRDV list). Hexamethylene Diisocyanate is found in the largest concentration in MIL-DTL-64159m Type I Coating, Water Dispersible Aliphatic Polyurethane Chemical Agent Resistant Coating (CARC), Catalyst. The acceptable "target risk" for noncancer endpoints is a hazard index of 1 or less, where hazard index is defined as:

$$\text{Hazard Index} = \frac{\text{Modeled Concentration of } X}{\text{Concentration of } X \text{ in Table}}$$

The hazard index based on potential to emit for Hexamethylene Diisocyanate is calculated to be 6.44. The allowable emission rate of Hexamethylene Diisocyanate that results in a hazard index of 1 is 0.0272 tons/year.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

The facility will be subject to emission caps of twelve (12) tons per year for VOC, three (3) tons per year for single hazardous air pollutant (HAP) and four (4) tons per year for combined HAPS. These emission caps will preclude the applicability of the following regulation: 401 KAR 59:225, New miscellaneous metal parts and product surface coating operations. Also, the maximum application rate of coating shall not exceed 8.43 gallons per hour so as to be in compliance with 401 KAR 59:010, New process operations, section 3(2). The emergency generators shall not operate more than 500 hours per year each. The facility will also be subject to an emission cap of 0.0272 tons per year for Hexamethylene Diisocyanate (CAS No. 822-06-0) for the purpose compliance with 401 KAR 63:020, Potentially hazardous matter or toxic substances.

**PERIODIC MONITORING:**

The paint booth particulate filter shall be inspected weekly for solids build-up. The hours of operation of the paint booth shall be monitored daily and the gallons of paint used in the paint booth shall be monitored daily. A qualitative visual observation of the opacity of emissions shall be performed weekly on the paint booth stack. For all natural gas boilers, the natural gas usage shall be monitored on a monthly basis. The fuel use of the diesel powered emergency generators shall be monitored monthly. All of the above shall be verifiable by appropriate records.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.